

pense. The stream has continued unabated in quantity, and is of excellent quality.

The following notes, relating to the earthquake of September 19th, were not received until after the publication of the REVIEW for that month, and show that the area affected by the shock extended about one hundred and fifty miles farther eastward than was determined from the reports previously received:

Professor Robinson of Howard University, Washington, District of Columbia, reports that he was sitting in his office writing when he felt a shock; he immediately noticed that the ink in his stand was waving, and also that one of the doors in the room just ajar thumped several times. He found on inquiry, that while several persons in the building had noticed nothing peculiar, yet one had felt the shock. He also found a lady in an adjacent building who had felt the shock, and, moreover, some workmen in the tunnel near the University had noticed the rumble and supposed it was made by a part of the wall caving in behind them. The time of the shock was, approximately, 3.20 p. m., eastern standard time.

It is also reported that the earthquake of September 19th, was felt by the workmen on the top of the Washington Monument (at that time about five hundred feet high); and by persons in upper stories of the Quartermaster's building.

SAND STORMS.

Maricopa, Arizona, 1st: during the morning the fresh westerly winds filled the air with clouds of sand and dust. At times it was impossible to see objects fifteen paces distant, and persons out of doors could breathe only with difficulty. Everything in the office building was covered with sand, and telegraphic communication was interfered with on account of the fine sand working into the bearings of the instruments.

A sand-storm also occurred at Los Angeles, California on the 1st.

WATER SPOUTS.

Galveston, Texas: at about 10.30 a. m. on the 19th, a water-spout was observed east of this place, passing in a northerly direction. It moved slowly for some distance and then broke, the cloud above it assuming a common appearance.

ERRATA.

In the September REVIEW on page 227, near the bottom of the second column, the tornado published as having occurred near Alton, Pennsylvania, and moved southwestward, should read *occurred at Alton, and moved northeastward*.

On page 238, September REVIEW, second column, under "Water Spouts," Washington Observatory, should read *Washburne Observatory*. The water spout there referred to occurred on September 10th, the date having been omitted in that REVIEW.

NOTES AND EXTRACTS.

The following extract is from the October report of the "Ohio Meteorological Bureau," under direction of Professor T. C. Mendenhall:

The mean atmospheric pressure for the month does not differ materially from that of October, 1883. It was about one-tenth of an inch greater than that of the previous month, but the range was less than in September or in October, 1883.

The most noticeable feature of the weather was the unusually high temperature reported from many stations during the first few days of the month. Seven observers recorded a maximum of over 90° and the highest being 99° at Ironton, on the 1st, which is the maximum reported to the bureau from the beginning. The highest temperature reported during the year ending October 31, 1883, was 98°. The mean temperature for the month, 56° 3, was 3° higher than that for October, 1883, and 4° higher than the normal for the month.

The month was also remarkable for the small rainfall, being about two-thirds of the normal amount.

State summary.

Atmospheric pressure: mean for the state 30.14; highest barometric reading, 30.55, at Marietta, on the 15th; lowest barometric reading, 29.74, at Wauseon, on the 8th; monthly barometric range, for the state, 0.82; station reporting greatest monthly range, Wauseon, 0.80; station reporting least monthly range, Ironton, 0.43. All stations report the lowest barometric readings on the 8th, and the highest were recorded on either the 14th or 15th.

Temperature: monthly mean for the state, 56° 3; station reporting highest monthly mean, Cincinnati, 61° 3; stations reporting lowest monthly mean, Junction and Gambier, 52° 6; station reporting maximum temperature, Ironton, 99° on 1st; station reporting minimum temperature, Wauseon, 18°

on 24th; monthly range of temperature for the state, 81°; station reporting greatest monthly range of temperature, Ironton, 80°; station reporting least monthly range of temperature, Cleveland, 52° 5; station reporting greatest daily range of temperature, Ironton, 48° on 16th; station reporting least daily range of temperature, Sandusky, 3° 4 on the 14th.

Relative humidity: monthly mean for the state, 75.6 per cent.; station reporting highest monthly mean, Ohio State University, 83.3 per cent.; station reporting lowest monthly mean, Cincinnati, 67.9 per cent.

Precipitation: average for the state, 1.88 inches; station reporting largest monthly rainfall, Junction, 5.14 inches; station reporting least monthly rainfall, McConnelville, 1.13 inches.

Wind: prevailing direction for the state, sw.

NOTE.—The above summary is based on the reports from thirty-four stations.

The following extract is from the October report of the "Alabama Weather Service," Professor P. H. Mell, director.

AGRICULTURAL AND MECHANICAL COLLEGE,

Auburn, Alabama, November 1, 1884.

The drought which began in August and extended through September, continued also through October until the last week. Streams and wells dried up, causing much suffering for man and beast, especially in northern, central, and eastern Alabama. A number of cotton gins suspended work in September for want of water power from the streams, and in this month steam gins have been inconvenienced by failing wells. The 22d was the first day of general showers; and gentle rains fell also from the 26th to the 29th. No violent rains have fallen, and the suffering for water is not yet relieved.

The precipitation along the coast was normal, but there was a gradual deficiency proceeding northward; and in northern and eastern Alabama the rainfall was below the average, two inches and upward. The precipitation for the whole state for the past three months, August, September and October, was seven inches below the normal.

The first week of the month was very warm. A number of stations report the highest temperature of the season during that period. On the 9th a "cold wave" was predicted by the Chief Signal Officer, "a fall of from fifteen to twenty degrees in twenty-four hours." This was verified with remarkable accuracy in the entire western portion of the state, and partially verified in the eastern portions as there was a fall of three or four degrees. The temperature gradually decreased from this date until the 16th when the first frost is reported, a slight frost visible only in low grounds and wet places. The temperature then rose immediately and very rapidly, all stations giving the 17th as the day of greatest range of thermometer. After the showers of the 22d a second frost occurred on the 24th and another on the 25th. Those two frosts were heavy in north Alabama; in other sections the mercury in several places fell below freezing, and the first ice of the autumn was reported. But the damage was confined principally to the low grounds, as the earth and air were still too dry to be greatly affected by the cold.

The temperature rose slowly after these frosts, and the weather remained mild and showery to the close of the month. The 27th and the 28th were the days of the least range of temperature showing it to be nearly stationary.

The average temperature of the state exceeded the normal by 40°.

No rain of importance fell until the 22d.

The "Louisiana State Weather Service," under the direction of Mr. Robert S. Day, furnishes the following report for October, 1884:

The weather continued very warm, almost at summer heat, until the 23d, when a cold wave entered the state from the northwest travelling rapidly, with a fall in temperature of 22° to 25°, as far as the Atchafalaya, east of which it traveled less rapidly, a drop of 16° to 20° being established on the 24th. The greatest cold prevailed in the northeastern parishes, frost being general in that section, and vegetation being killed or checked. Below New Orleans the wave was but little felt, reporting 61° at Port Eads as lowest point. In the southwest portion of the state warm weather returned on the 26th and 27th, with easterly winds and rain, but this weather appears to have been confined to the Gulf shore and lower swamp country. Elsewhere the cool weather prevailed. High winds have been general. Good rains have fallen in the southern portion of the state, but the northern parishes are still far below the average.

State summary.

Mean temperature for October, 1884, 70° 8; highest temperature, Franklin, 7th and 8th, 99° 0; lowest temperature, Delta, 24th, 28° 0; greatest daily range, Delta, 19th, 46° 8; least daily range, Vidalia, 9th and 10th, 1° 0.

Average rainfall, 3.61 inches; greatest daily rainfall, 5.81 inches, New Iberia, 26th; greatest rainfall for month, 7.90 inches, Franklin; rainfall since January 1st, 48.87; average rainy days, 5.

Light frost at Delta, 24th. Very high northerly winds on the 9th, 10th, 22d, 25th.

Lunar halos: Port Eads, 3d; New Orleans, 26th, 29th; Shreveport, 3d.

Thunderstorms and lightning: Port Eads, 2d, 20th, 21st, 27th. Lightning observed at Port Eads, 6th, 11th, 12th, 18th, 22d, 23d. Port Eads, strong winds 1st, 3d, 5th, 21st, 26th, 30th; squall and light gale on 4th, 20th, 24th. These winds ranged from northeast to southeast.

Thunderstorm: New Orleans, 2d, 21st, 26th.

Lightning: New Iberia, 2d, 19th; very high winds 23d, 24th, 29th.

REPORT OF THE MISSOURI WEATHER SERVICE, OCTOBER, 1884.

At the central station the temperature of the month of October has been 62°.8, which is 6°.7 above the normal. The extremes of temperatures were 33°.0 on the 23d and 88°.5 on the 6th, the month being remarkable for its uniform temperature.

In former years the temperature has fallen to the freezing point as early as October 4th (in 1836) and has fallen as low as 19°.5 on the 31st (1863). The highest maximum ever observed was 91°, in 1867. The temperature has never before been known to rise above 88°.5 after the 5th of October.

In the state the lowest minimum temperature reported was 18°.5, at Centreville, on the 24th. The minimum temperatures of a majority of the stations range from 28° to 32°. Lexington, Ironton, and Saint Louis reporting 33°, and being the only Missouri stations reporting where the temperature was not down to the freezing point. Mascoutah, Illinois, also reports a minimum of 33°, and at Cairo, Illinois, the minimum was 38°. The highest maximum observed was 92°, at Centreville and Greenfield.

The rainfall at the central station was 1.86 inches, the signal office, however, reporting 2.48 inches, the greater fall being caused by a local difference in the rain of the 4th. The normal fall for October is 3.05 inches. In the state the maximum fall of over 4 inches occurred west of a line drawn near Harrisonville, Glasgow, Chillicothe, and Atchison, Kansas. From this region the fall diminishes to 1.8 inches in the northwest and southeast.

The first killing frost in the state was observed on the 22d, and was reported from Sedalia and Phelps City. On the 23d killing frost was also observed at Chamois, Louisiana, Mexico, Ironton, Centreville, and Glasgow. In Saint Louis tender plants like the castor oil bean were unharmed at the close of the month.

Lexington reports: "immense flights of brown butterflies moving south on the 9th. The wet weather of September and October has delayed the sowing of wheat and has diminished the acreage. Corn in shock and wheat in stack have been badly damaged by excessive moisture."

Chamois reports: "wheat looking as well as I ever saw, with no damage by the Hessian fly. Corn crop extra good."

F. E. NIPHER,
Director.

The following is an extract from the October report of the "Nebraska Weather Service," under direction of Professor Goodwin D. Swezey, of Doane College, at Crete.

The weather during the month has been rather warmer than the average for October, with the rainfall about normal. The average rainfall in the different sections of the state, is as follows:

Northeast section, 3.48 inches; southeast section, 2.77 inches; northwest section, 2.15 inches; southwest section, 3.23 inches. Greatest number of rainy days, 9, at Fremont; least number of rainy days, 3, at Superior; average number of rainy days, 5.9.

Professor W. H. Ragan, of Greencastle, Indiana, furnishes the following meteorological summary for the state, with accompanying remarks:

Districts.	Temperature.				Precipitation.	
	Highest.	Lowest.	Monthly mean.	Departure from normal.	October, 1884.	Departure from normal.
Northern counties.....	90	30	56.1	+ 2	3.83	+2.50
Central counties.....	94	21	55.8	+ 1	2.24	0.60
Southern counties.....	95	24	59.9	+ 3	1.85	+1.40
State.....	95	21	57.4	+ 2	2.64

The mean temperature for the whole state was about two degrees above the normal. The first fourth of the month was warm and the last fourth was cold. The lowest temperatures in the southern counties were associated with the cold wave of the 23d and 24th.

The rainfall for the state was about the normal amount, but it was very unevenly distributed—ranging from 0.73 inch in Randolph county to 4.82 inches in White county.

Frosts were reported on the 9th, 10th, 15th, 23d, and 24th; on the two latter dates killing frosts were reported from nearly all counties.

Thunderstorms occurred in many counties on the 4th, 5th, 7th, 16th, and 24th.

Professor H. A. Huston, of Lafayette, Indiana, furnishes the following meteorological summary for the state:

Districts.	Temperature.			Average Rainfall.
	Highest.	Lowest.	Monthly mean.	
Northern counties.....	90	30	56.8	3.50
Central counties.....	91	24	56.2	2.68
Southern counties.....	95	24	60.0	2.16
State.....	96	24	57.3	2.58

